

Background on Bioenergy and Biofuels

What is bioenergy?

- Bioenergy is the general term for any form of renewable energy made from organic materials.

What are biofuels?

- Biofuels are just one form of bioenergy. Specifically they are transportation fuels (ethanol and biodiesel) made from renewable resources like corn and soybeans.

How does Indiana benefit from bioenergy and biofuels?

➤ Economic Development

- The production of both bioenergy and biofuels spurs economic development in rural areas and brings new ventures to these communities that otherwise would not ordinarily see investment. Bioenergy and biofuels projects create jobs for our state's workers and are an important market for Hoosier agricultural products, boosting agricultural profits.

➤ Energy Security

- Bioenergy and biofuels production provide an opportunity for immediately addressing our energy security issues by using domestic crops to produce fuel and renewable waste to create energy.
- Biofuels production reduces our dependence on foreign sources of oil by using renewable energy resources.

➤ Environmental

- Most biofuels are environmentally superior and contain very little sulfur and no toxic chemicals and can replace or be a substitute for dirtier fuel sources.
- Using biofuels can reduce hydrocarbons emissions, particulate matter emissions and carbon monoxide emissions.
- Bioenergy production offers a solution to waste management, by converting waste into usable energy. For example, livestock waste and wood waste are excellent sources of energy. By using these renewable sources of energy, we can reduce the effects, such as odor, of waste on our communities and environment.

How many biofuels plants are there in the state and how much do they contribute to Indiana's economy?

- In January 2005, Indiana had only one ethanol plant, even though it is the fifth largest corn state. While many ethanol plants have been discussed in communities and the media, ISDA has compiled a list of ethanol plants which received substantial incentives from the state since 2005. One bushel of corn produces 2.28 gallons of ethanol, so the 12 ethanol plants that have received state incentives would produce more than 1 billion gallons of ethanol annually and use approximately 380 million bushels of corn annually.
- Indiana is the fourth largest soybean state, but it had no biodiesel plants in 2005. Now it has four biodiesel plants operating or under construction, expected to produce a total of 100 million gallons of biodiesel.
- The 12 new ethanol plants and four new biodiesel plants will create 620 new jobs for Hoosier workers. In total, they will put at least \$29.5 million into local farmer pockets and invest more than \$1.47 billion in capital expenses.
- Additional jobs will be created in upstream and downstream agribusiness sectors including farm inputs, transportation, further processing and marketing.

Why are the state's biofuels and bioenergy initiatives important?

- Indiana is proud of the rapid success we have had in corn-based ethanol production. Corn ethanol is energy efficient, with an energy ration of 1.34. That is, for every BTU dedicated to producing ethanol there is a 34 percent energy gain. *Source: The Energy Balance of Corn Ethanol: An Update/ AER-813 (USDA)*

- Indiana can be a model for the nation in showcasing how we can produce the next generation of domestically-grown fuel, through cellulosic ethanol production. Cellulosic ethanol is made from other low-value biomass sources, such as corn stover and wood waste.
- Bioenergy is also created from renewable resources, such as corn stover, livestock manure and paper fluff, and is a clean alternative to traditional waste management techniques.
- Bioenergy is only one piece of the energy solution. Bioenergy production will not replace Indiana's abundant source of coal, but it will compliment all sources of energy, including wind and other renewable resources.
- Through new innovations in bioenergy production, we will help meet America's growing demand in energy production, including electricity and fuel.

Will Indiana have enough corn to supply the new ethanol plants?

We expect to have sufficient corn supplies for the following reasons:

- During the past 6 years, Indiana has exported on average more than 50 percent of the corn we produce. In the short term, our state's exports will decrease in favor of keeping corn close to home for use in feed and fuel.
- As U.S. ethanol production expands, higher U.S. and world corn prices would provide incentives for Brazil and Argentina to expand corn production and compete with U.S. corn in world markets.
- USDA estimates that by the 2010 crop year the United States could support more than 15 billion gallons of corn-based ethanol production by producing 89 million acres of corn.
- Corn yields since 2004 have exceeded the long-term trends. Each 5 bushel increase in yield above the current trend would be the equivalent to adding approximately 2.5 million acres to corn plantings nationally, enough to produce an additional 1 billion gallons of ethanol. The trend in the United States since 1996 has been an additional 2.7 bushels per acre per year yield to each acre of corn produced, or adding the equivalent of 500 million gallons annually.

What is E85? What is a flex-fuel vehicle?

- E85 is a blend of 85 percent ethanol and 15 percent gasoline.
- E85 can only be used in flex-fuel vehicles (FFV). FFVs are vehicles that are especially equipped to use both regular unleaded gasoline and any blend of ethanol and gasoline up to 85 percent ethanol. If your car is not certified as a FFV, you should not use E85.
- FFVs are not the same thing as hybrid vehicles. FFVs means that the automobile is flexible to use either 100 percent unleaded gasoline or any blend of ethanol and gasoline up to 85 percent ethanol. Hybrid vehicles are powered from a combination of electricity and unleaded gasoline. They cannot use E85.
- Much of the unleaded gasoline sold in Indiana already contains up to 10 percent ethanol. This is safe to use in any vehicle.

How many E85 pumps are there in the state?

- In January 2005, there were no public E85 pumps and it was difficult to find a public biodiesel pump. As of December 2006, there are more than 60 E85 public pumps and numerous biodiesel pumps located throughout the state.
- ISDA and OED have joined with other biofuels partners on a biofuels informational website, www.biofuelsindiana.com. This Website answers common questions about biofuels and directs Hoosiers to E85 and B20 pumps across Indiana.

What is BioTown, USA?

- BioTown, USA is the country's first community where all energy needs will be met through biorenewable resources. The pilot is located in Reynolds, Indiana (White County).
- The town's energy needs will soon be met through the BioTown Technology Suite, consisting of three complimentary systems: an anaerobic digester, a gasifier and fast pyrolysis.
- The BioTown Technology Suite will be a near-closed loop, self-sufficient system taking animal waste, municipal waste, corn stover and other types of biomass and turn them into electricity, crop inputs such as fertilizer, thermal energy and biodiesel.

Source: Indiana State Department of Agriculture, 2007